MARINE CORPS SYSTEMS COMMAND

EQUIPPING THE WARFIGHTER TO WIN

Infantry Weapons System
Product Group 13
Optics and Non-Lethal Systems
Program Office

Squad Thermal System (STS)
Industry Conference

2-4 December 2009

Program Office: PM ONS
Program Manager: Mr. Eric Miller
Project Officer: Mr. Benjamin Kaler
Capabilities & Integration Officer: Mr. Charles Clark
Advocate/ Representative: Major Steven Fiscus
MCOTEA Representative: Major Glindon Ashbrook

Administrative Remarks

Mr. Michael Berry

- If you have a cell phone please put it on manner mode
- The telephone number for emergencies is at Lockheed Martin 540-658-5500
  - This is the location of individual briefings: 125 Woodstream Blvd. Stafford, VA 22556
- Restrooms are located just outside the conference room.
- Parking is only permitted in the large parking lot located across the street from the General Alfred M. Gray Research Center located at 2040 Broadway Street Quantico, VA 22134
- Only designated smoking areas should be used
- Meals can be obtained in the town of Quantico, Dumfries, and Stafford.

Ground Rules

Mr. Michael Berry

- Please hold all questions to the end of the individual presenters brief or hold until the one-on-one sessions
- Take every precaution to protect proprietary information
- Classified information will not be discussed
- MARCORSYSCOM has limited access; requires prior coordination
- EVERYONE must sign attendance log
- Foreign Nationals must be escorted
- All verbal questions will be recorded and published
- Questions must be written, and will be published subsequently
- Squad Thermal System or PM ONS briefing related questions only
- Please submit WRITTEN comments/suggestions at any time via email by 31 January, 2010.

Disclaimer

Mr. Michael Berry

- The information provided herein is for information only, and to initiate communication with industry, reduce timelines and minimize amendments.
- The content herein is subject to change
- No current product solicitation exists for the Squad Thermal System
- This conference in no way obligates the Government to purchase any product.

Conference Agenda

Mr. Michael Berry

Wednesday, 2 December 2009

0830-0845	Check in
0845-0900	Opening Remarks
0900-0915	Overview of PM ONS
0915-0930	Technical Requirements Introduction
0930-0950	NVThermIP
0950-1005	Break
1005-1050	Technical Requirements
1050-1115	Logistics Requirements
1115-1130	Questions & Answers
1130-1230	Transit/Lunch
1230-1345	SwRI
1400-1515	Nivisys
1530-1645	Insight Technology

Conference Agenda

Mr. Michael Berry

Thursday, 3 December 2009

0830-0945	Trijicon Inc.
1000-1115	L-3 Electro Optical Systems
1115-1215	Lunch
1215-1330	DRS RSTA
1345-1500	Raytheon
1515-1700	TBD

Friday, 4 December 2009

0830-1120	Candidate vendor one-on-one sessions with PM ONS
1120-1230	Lunch
1230-1700	Candidate vendor one-on-one sessions with PM ONS

Welcome Aboard!

Mr. Eric Miller

Program Manager

Optics and Non-Lethal Systems (PM ONS)

Purpose and Mission

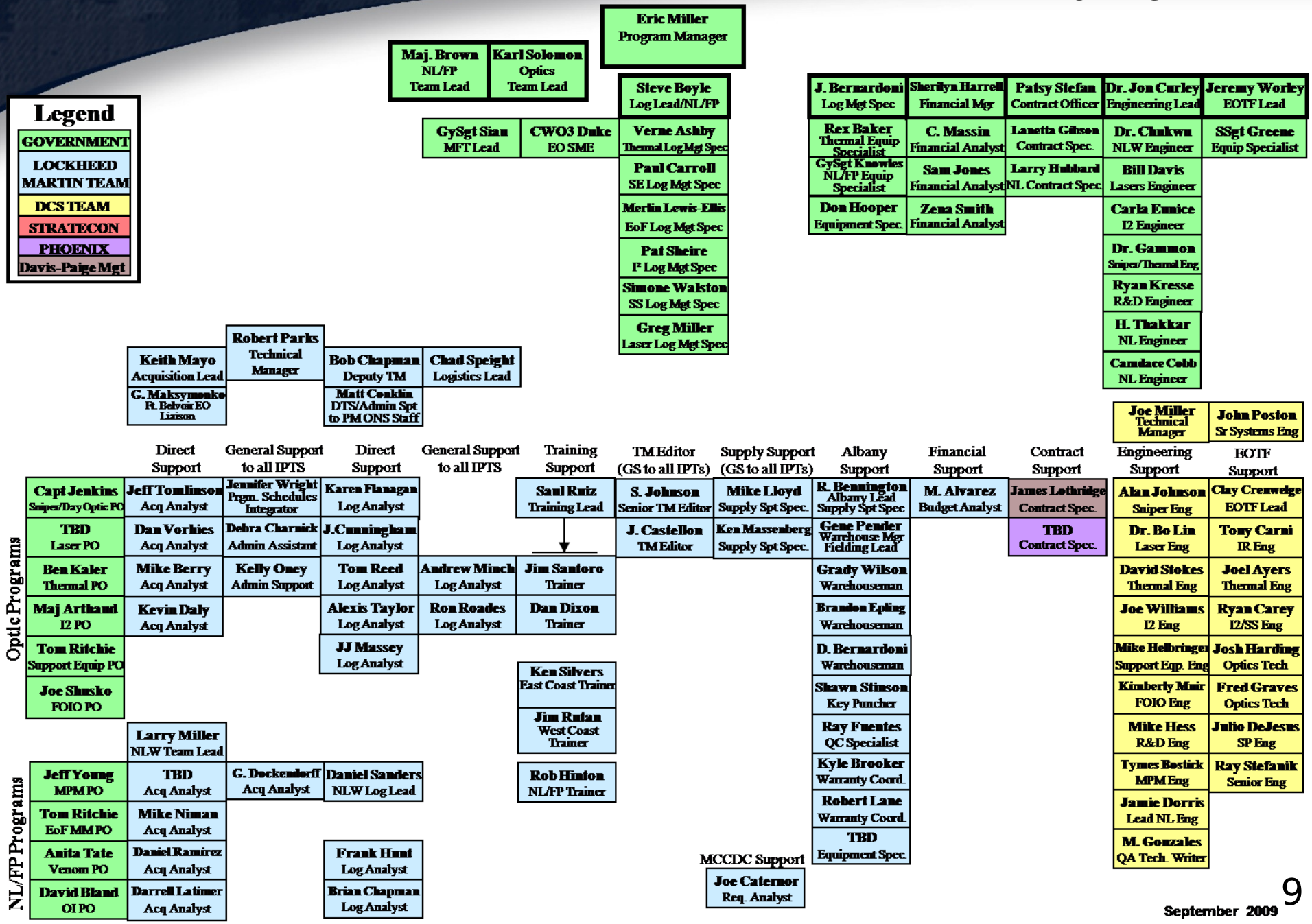
Mr. Eric Miller

Purpose: Provide key industry partners a joint combat developer/materiel developer path ahead to foster a coordinated effort in the procurement of the Squad Thermal System.

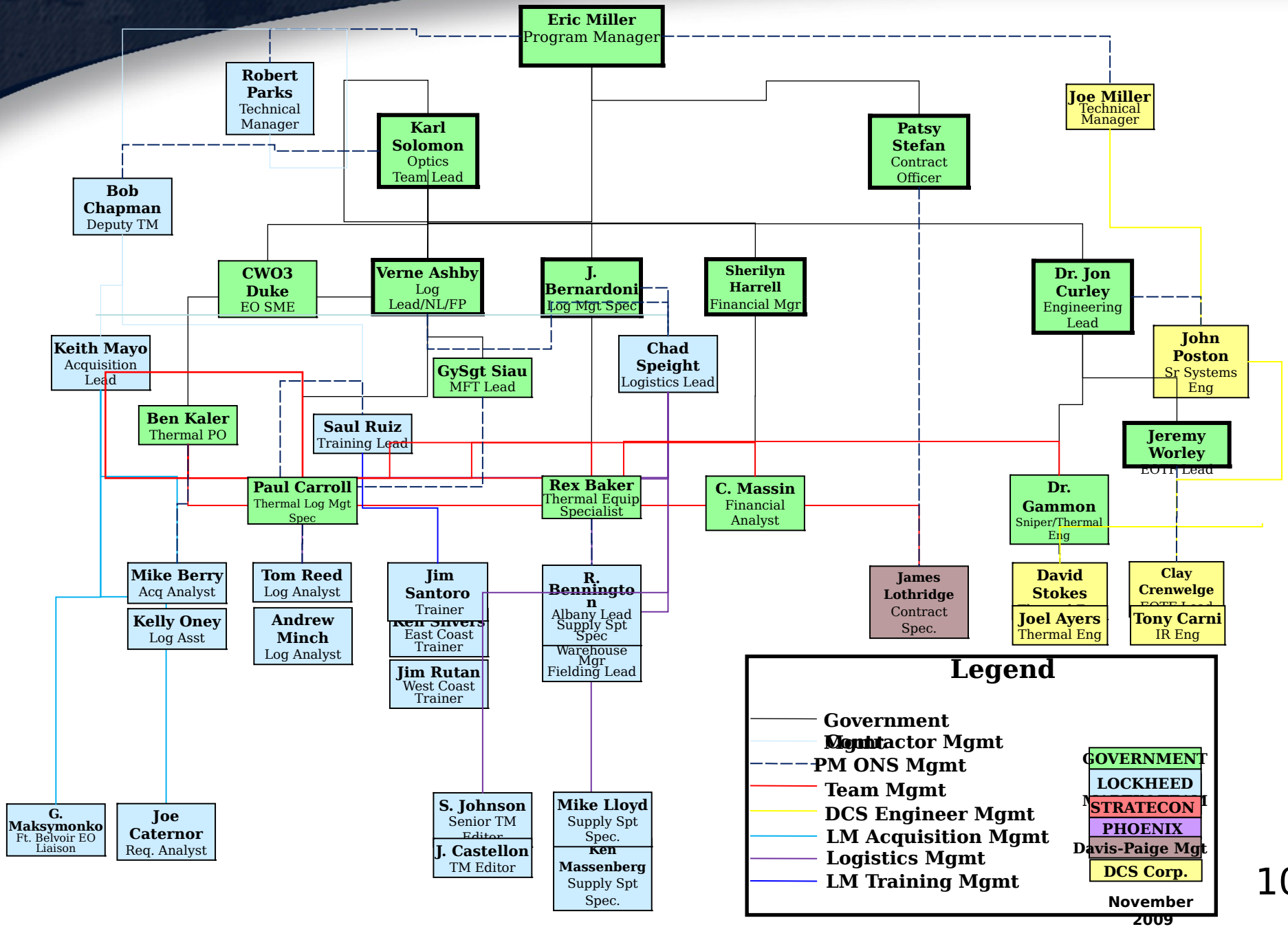
Mission Statement: To develop, test, procure, field, and sustain Target Acquisition Systems for the Marine Warfighter by providing Total Life Cycle Systems Management (TLCSM) and effective and timely integration of Acquisition, Logistics, and Advanced Technologies.

PM ONS Organization

Mr. Eric Miller



Thermal IPT


Eric Miller
Program Manager
Robert Parks
Technical Manager
Karl Solomon
Optics Team Lead
Patsy Stefan
Contract Officer
Joe Miller
Technical Manager
Bob Chapman
Deputy TM
CWO3 Duke
EO SME
Verne Ashby
Log Lead/NL/FP
J. Bernardoni
Log Mgt Spec
Sherilyn Harrell
Financial Mgr
Dr. Jon Curley
Engineering Lead
Keith Mayo
Acquisition Lead
GySgt Siau
MFT Lead
Chad Speight
Logistics Lead
John Poston
Sr Systems Eng
Ben Kaler
Thermal PO
Saul Ruiz
Training Lead
Jeremy Worley
Paul Carroll
Thermal Log Mgt Spec
Rex Baker
Thermal Equip Specialist
C. Massin
Financial Analyst
Dr. Gammon
Sniper/Thermal Eng
Mike Berry
Acq Analyst
Tom Reed
Log Analyst
Jim Santoro
Trainer
R. Benningto n
Albany Lead
Supply Spt Spec
James Lothridge
Contract Spec.
David Stokes
Clay Crenwelge
Kelly Oney
Log Asst
Andrew Minch
Log Analyst
East Coast Trainer
Warehouse Mgr
Joel Ayers
Thermal Eng
Tony Carni
IR Eng
Jim Rutan
West Coast Trainer
Fielding Lead
G. Maksymonko
Ft. Belvoir EO Liaison
Joe Caternor
Req. Analyst
S. Johnson
Senior TM Editor
J. Castellon
TM Editor
Mike Lloyd
Supply Spt Spec.
Ken Massenberg
Supply Spt Spec.
Legend
Government
Contractor Mgmt
PM ONS Mgmt
Team Mgmt
DCS Engineer Mgmt
LM Acquisition Mgmt
Logistics Mgmt
LM Training Mgmt
GOVERNMENT
LOCKHEED
STRATECON
PHOENIX
Davis-Paige Mgt
DCS Corp.
November 2009

Technical Requirements

Mr. Michael Berry

Senior Acquisition Analyst

Thermal Systems Integrated Product Team (IPT)

Technical Requirements

Mr. Michael Berry

Technical Evaluation Criteria: Omitted from this brief. This will be provided only after a Solicitation is released for STS. At this time there is neither a Solicitation, nor an RFP. There is no funding for the STS at this time.

Speaker Disclaimer Statement: No speaker or briefer in this conference is authorized to commit the Government in any binding agreement. Only the Contracting Officer may do so, and only in writing. The information presented in this brief is for informational purposes only, and is subject to change with little or no notice. Note that the specifications for the STS are based on an actual requirement from MCCDC, but are also subject to change. If you wish to conduct discuss current contracts, then you should set up an individual appointment with the Contracting Officer specifically for that purpose. Questions and answers will be restricted to the STS subject throughout the duration of the conference.

NVTherm

INTRODUCTION

- The NVTherm IP model predicted range performance will be used as the basis for compliance of the range requirements in the performance specification.
- Use NVTherm IP dated Jan/Feb 2007.

GENERAL NOTES

This guide uses illustrative screen grabs from the NVTherm IP user interface to provide tips on proper inputs for the corresponding input fields.

Key to abbreviations:

CFI = Contractor Fill In
GFI = Government Furnished Input
N/A = Not Applicable (value present does not matter)

All non-integer numerical input values shall be to 4 significant figures (unless otherwise indicated).

NVTherm

3. The values in the fields of this document are comprised of GFI, CFI and N/A:

- GFI = Value(s) to be used for all cases except as indicated
- CFI = Arbitrary examples are provided; intended to be replaced by real data to be provided by the Contractor. Note: These may not be realistic "default" values.
- N/A = Value entered does not matter; field does not factor into calculations.
- sF = Significant figures

4. In places where narrative is required, place in a MS Word file.

5. Frame rate is the rate associated with the FPA, not the video. As a example, if the FPA is queried at 30hz and displayed at 60hz, the appropriate frame rate is 30hz with electronic interlace.

6. Electronic interlace is used for staring systems when both the FPA and video are operating with multiple (unique) fields per frame. As an example, if 480 detector rows are being displayed via RS-170, and alternate rows are read out for each of 2 video fields, electronic interlace is being applied.

7. Detector pixel dimensions used by the model are the active regions. Detector pitch will be calculated internally by the model.

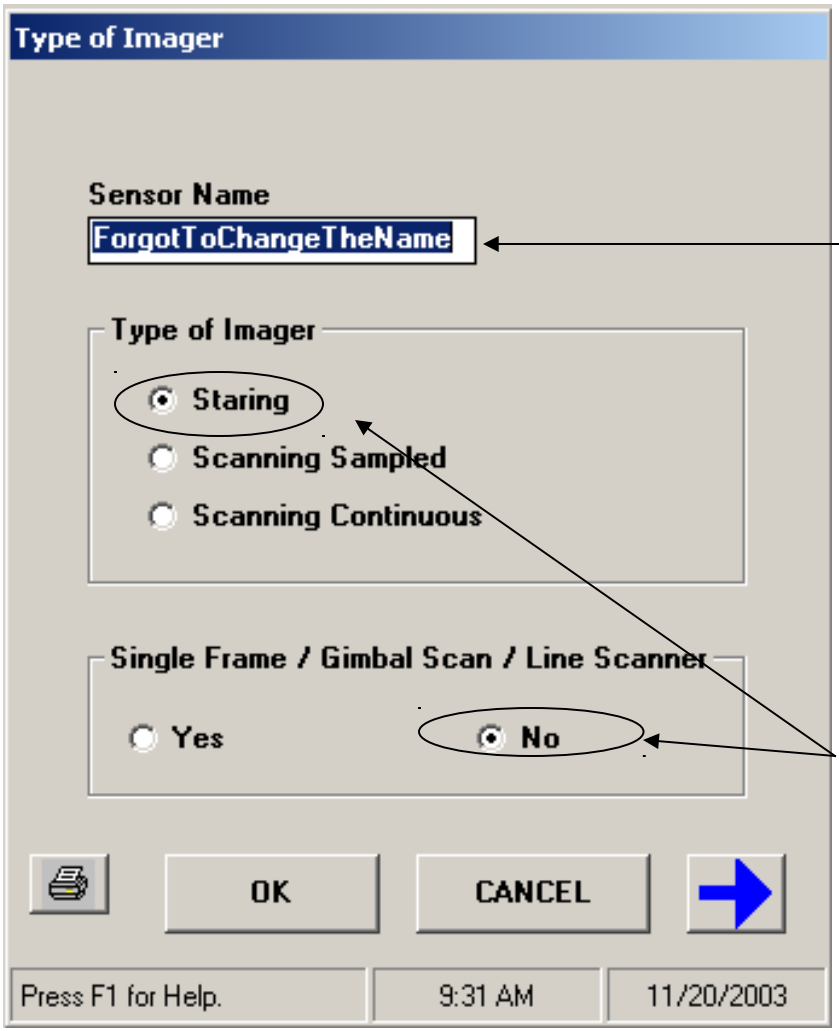
NVTherm

8. When using an optic after the display, the following changes need to be made in order to account for this additional optic:

a) An additional MTF should be added to the Postsample Vertical and Horizontal MTFs, reflecting the respective MTF's of the additional optics.

b) If there is an additional magnification due to the additional eyepiece optic, then the overall System Magnification on the System Parameters page should reflect the overall (magnification) change.

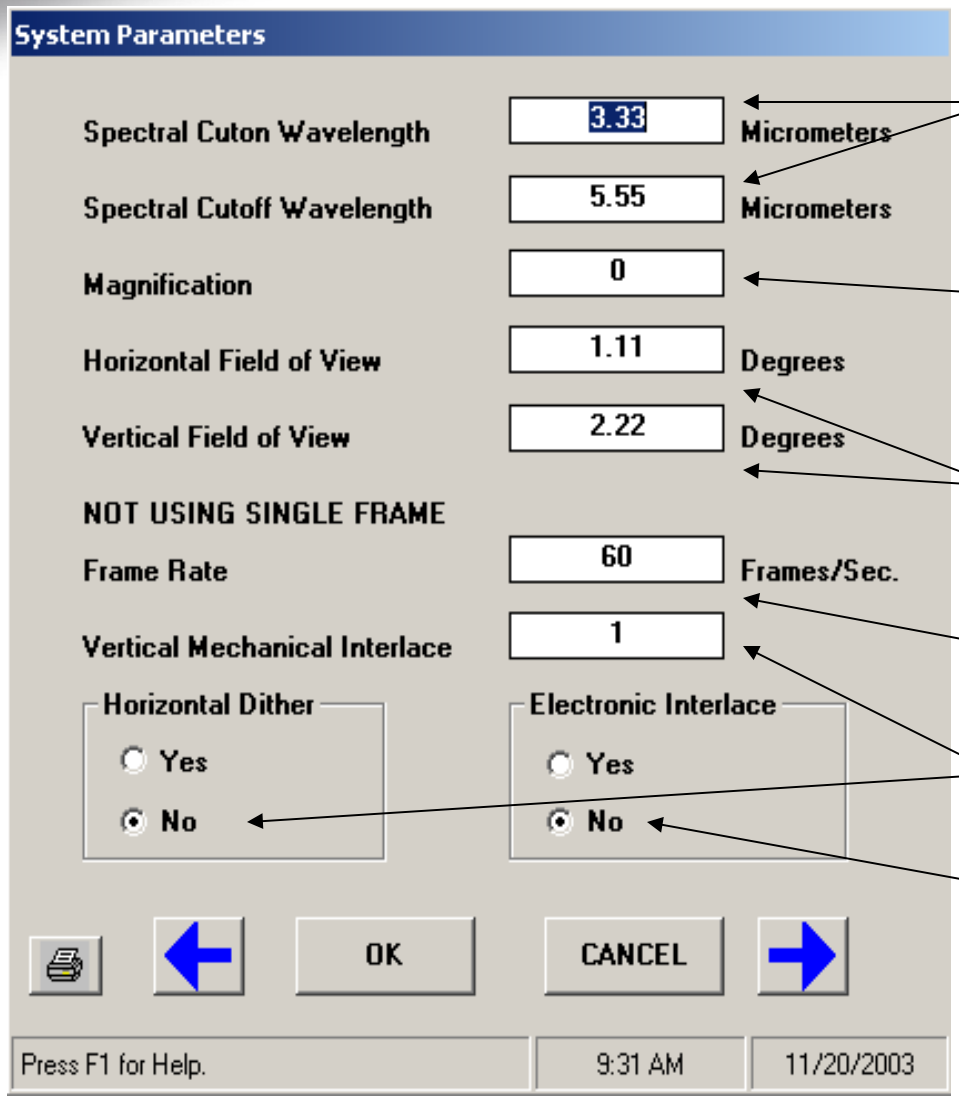
Type of Imager



Sensor Naming Convention for this field

Circled are GOVT FURNISHED INPUTS (GFI).

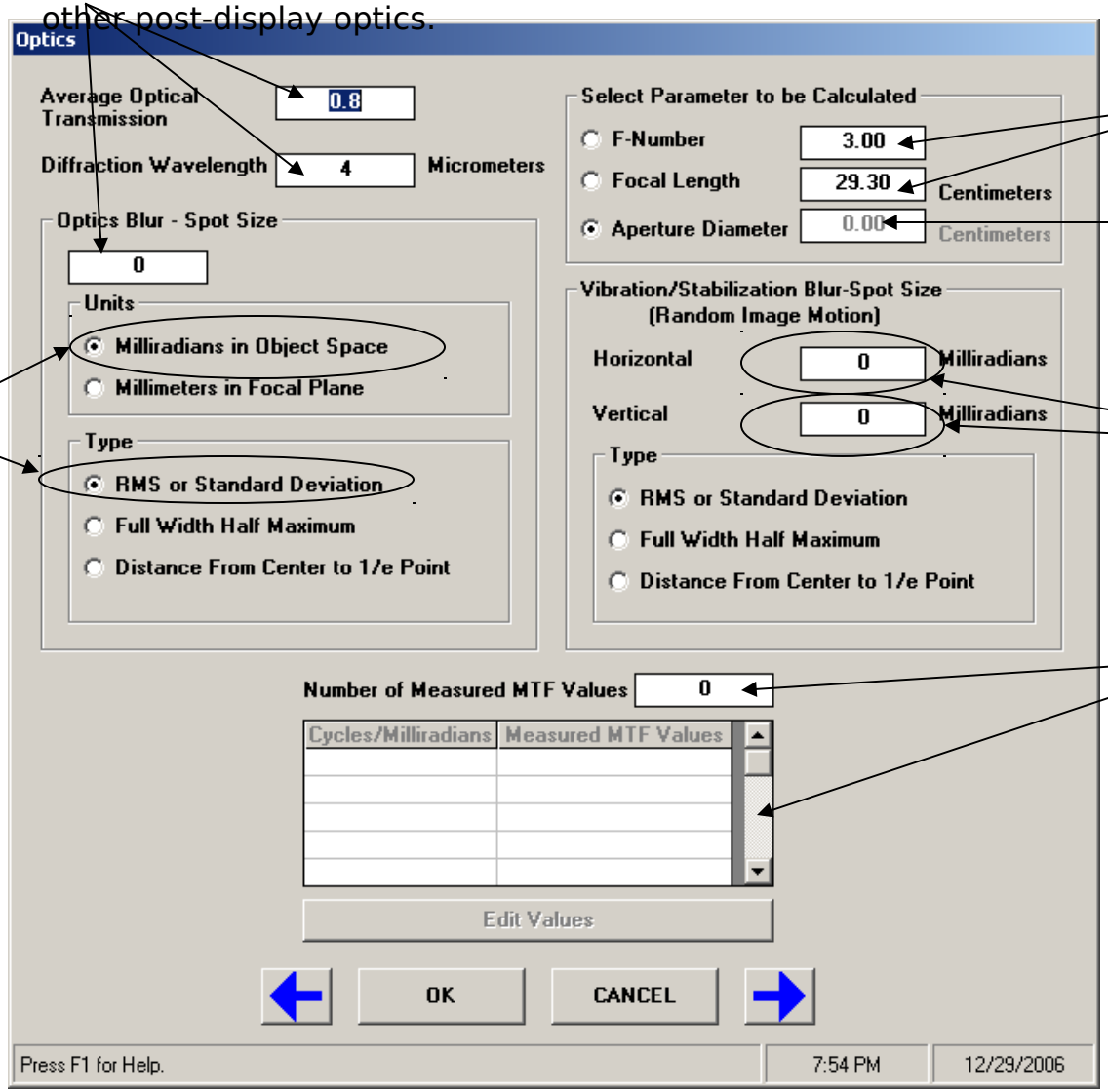
NVTherm



- CFI – Cuton and Cutoff values should represent the 50% normalized spectral response detector, optics, and additional filters.
- CFI – If '0' is entered, the magnification will be calculated within the program. Narrative is required if a system magnification other than '0' is entered. (See General Note 8)
- CFI – An input deck needs to be created for each set of optical FOVs
- CFI – Narrative required. (See General Note 5)
- GFI
- CFI – Interlace applies only to the sensor display. (See General Note 6)

NVTherm

• CFI (2sF) – The Optics Blur – Spot Size should be the geometric blur only, as the program will calculate the diffraction spot size- The -Average Optical Transmission entry should be the transmission over the spectral cuton and cutoff, and should not include the eyepiece or other post-display optics.



• GFI

• CFI (3sF) Recalculate for each optical field of view

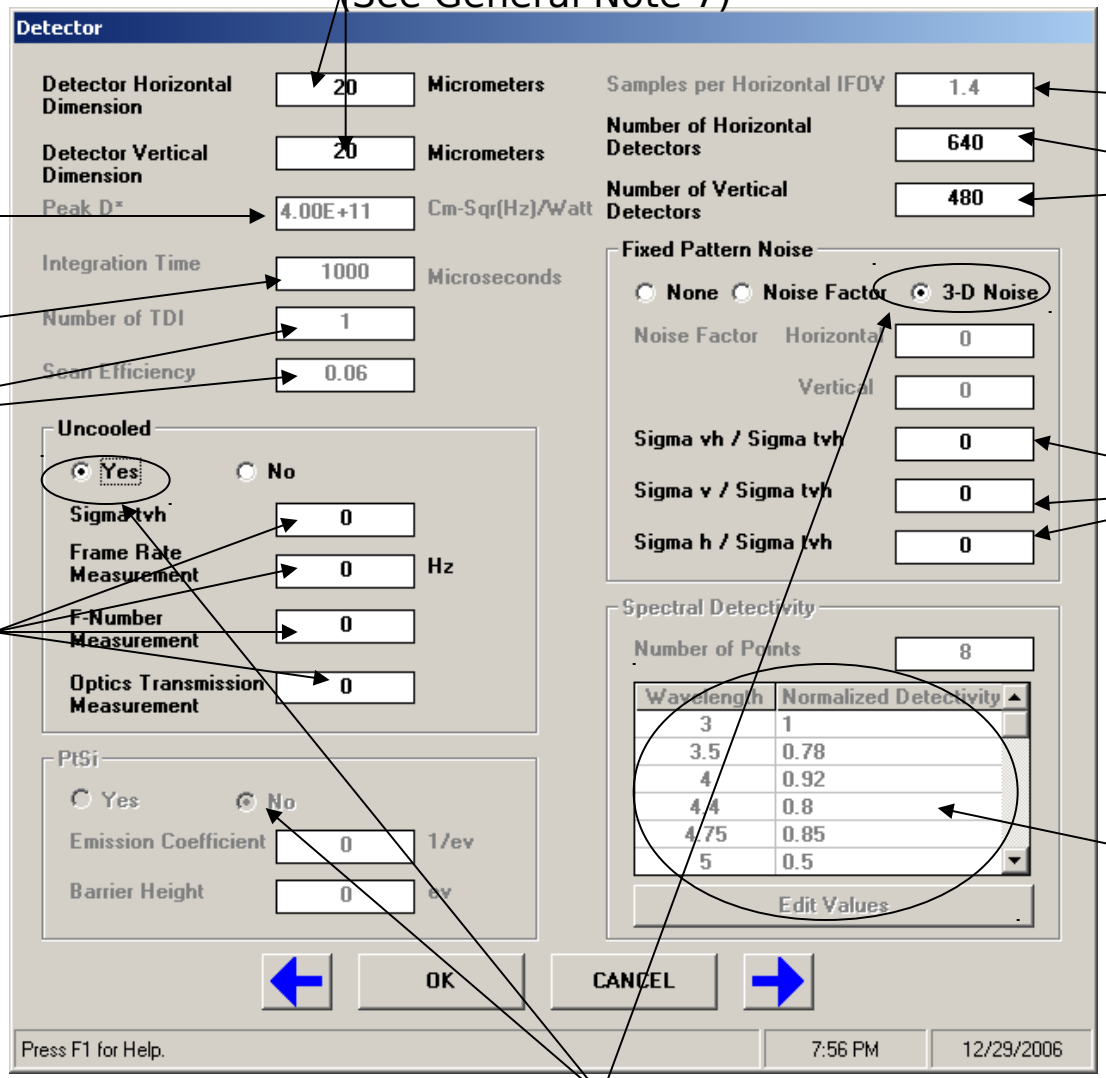
• This quantity is usually the diameter of the aperture stop. It is auto-calculated using CFI f-number and focal length.

• GFI = “0”

• CFI. Optional. However, if provided, submit narrative as to method of data collection.

NVTherm

• CFI (3sF)
(See General Note 7)



• N/A

• CFI (3sF)

• N/A

Using #'s from OPTICS and SYSTEM PARAMETERS screens. If different, narrative required as to rationale.

• CFI

• N/A

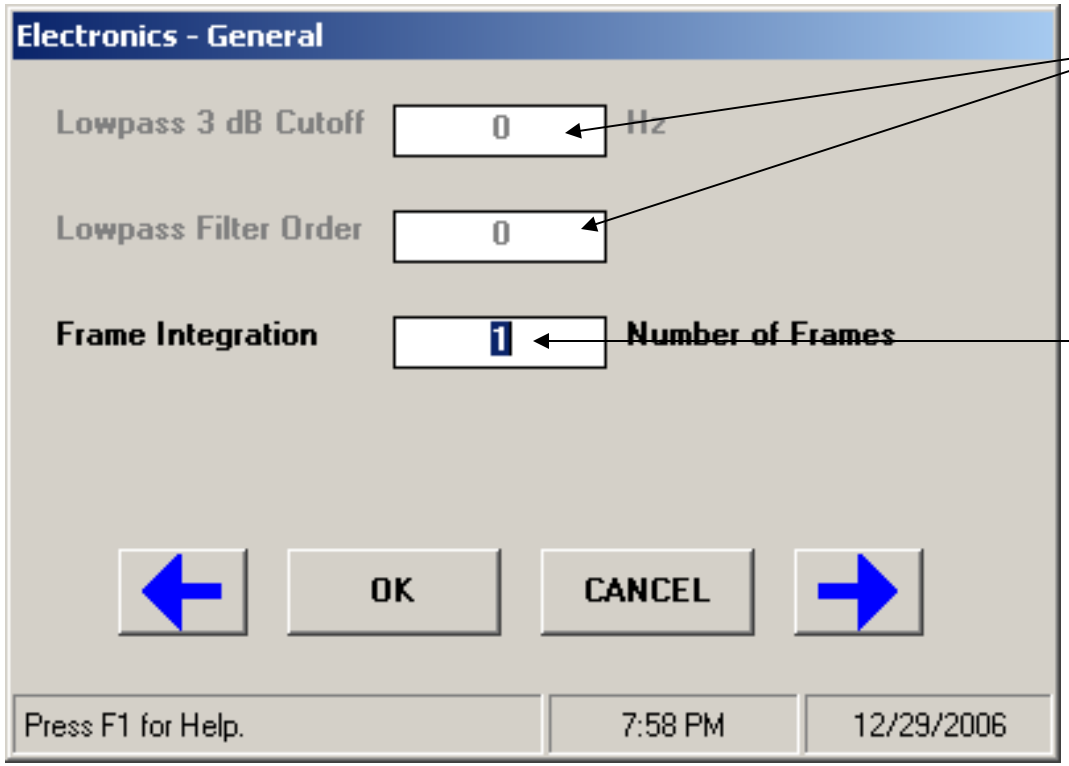
• CFI

• CFI (3sF)

• GFI

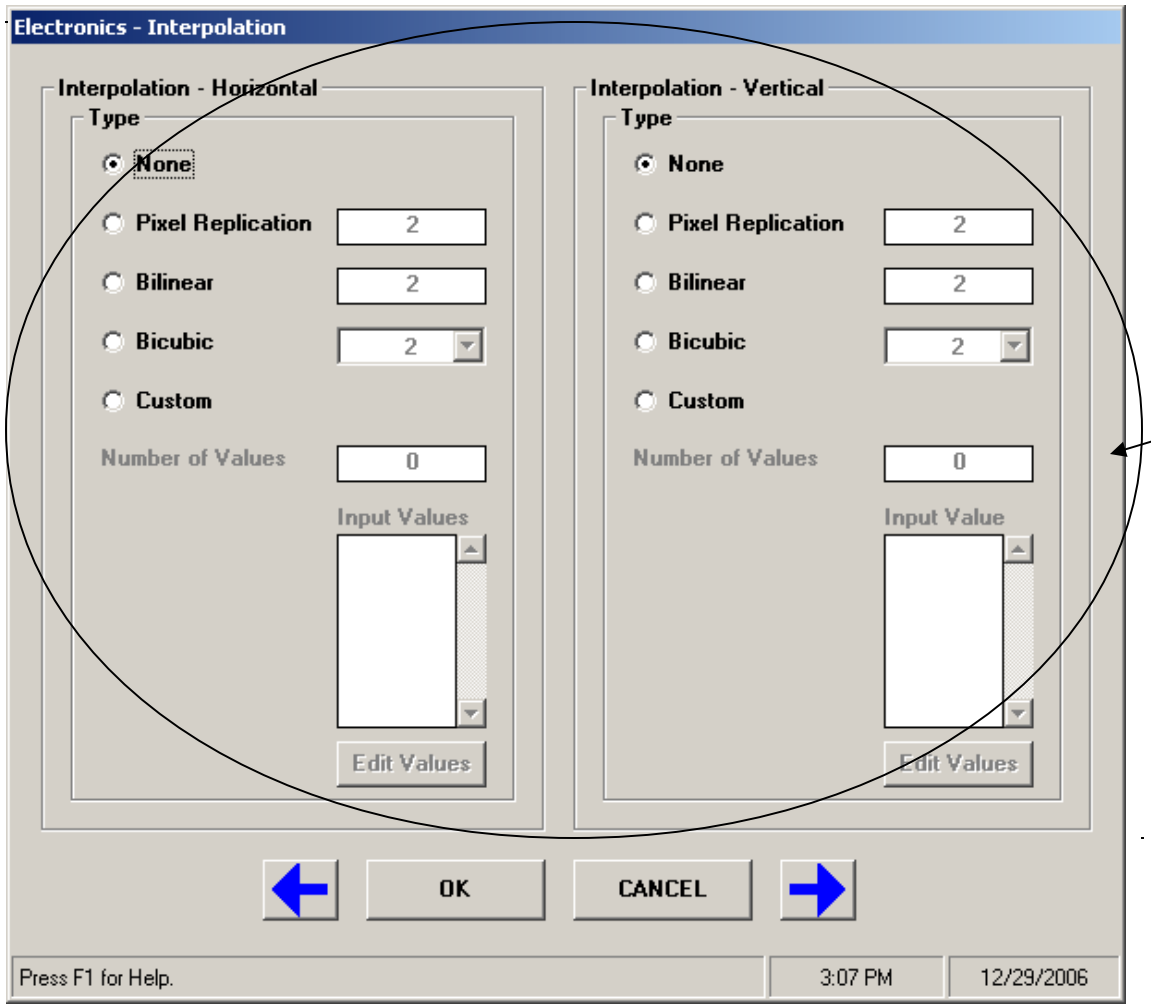
• CFI. This is optional. If provided, give narrative as to method of data collection.

NVTherm



- N/A
- CFI

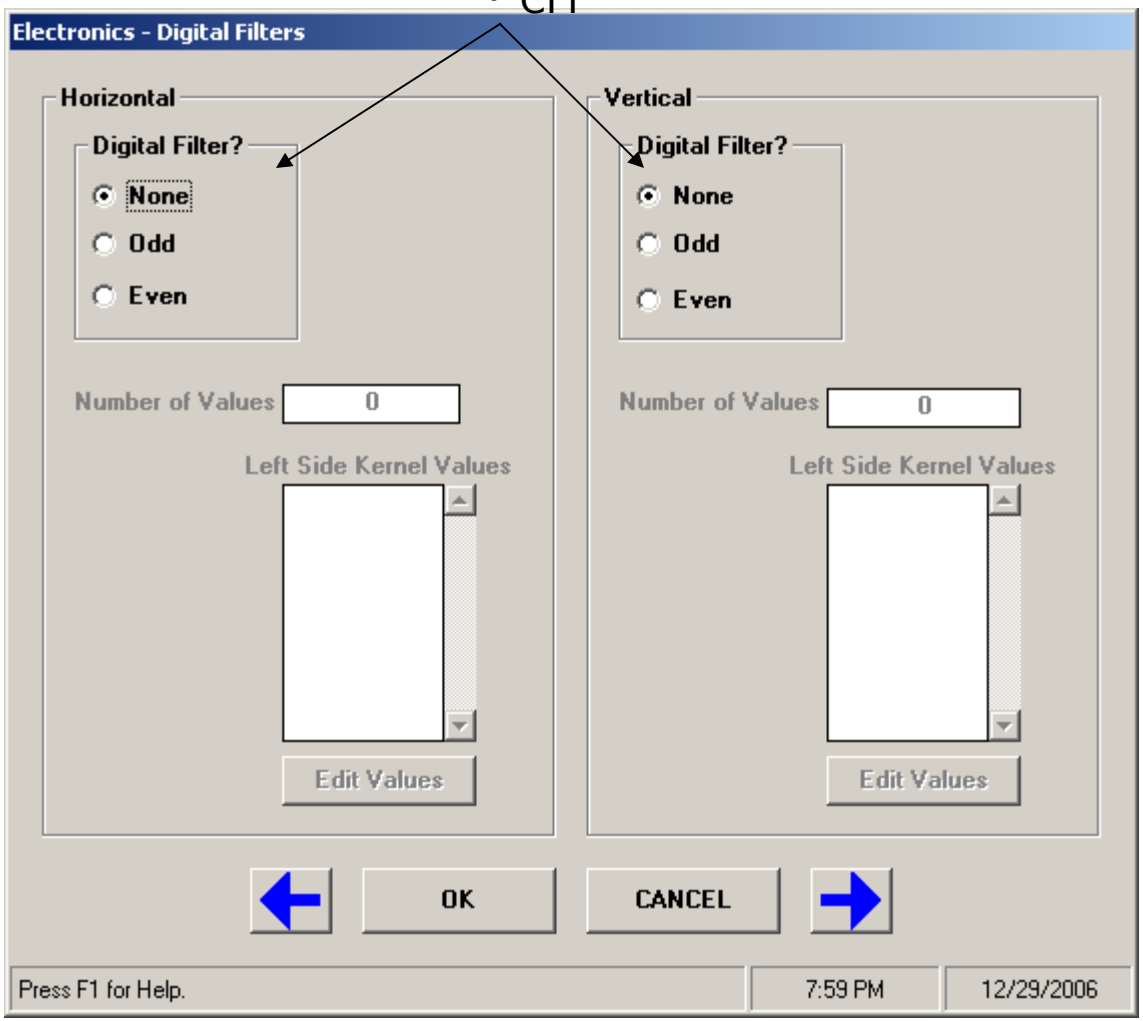
Electronics Interpolation



- CFI for all sensor display inputs. Interpolation is associated with spatial repeat of the detector data to increase the number of display pixels.

NVTherm

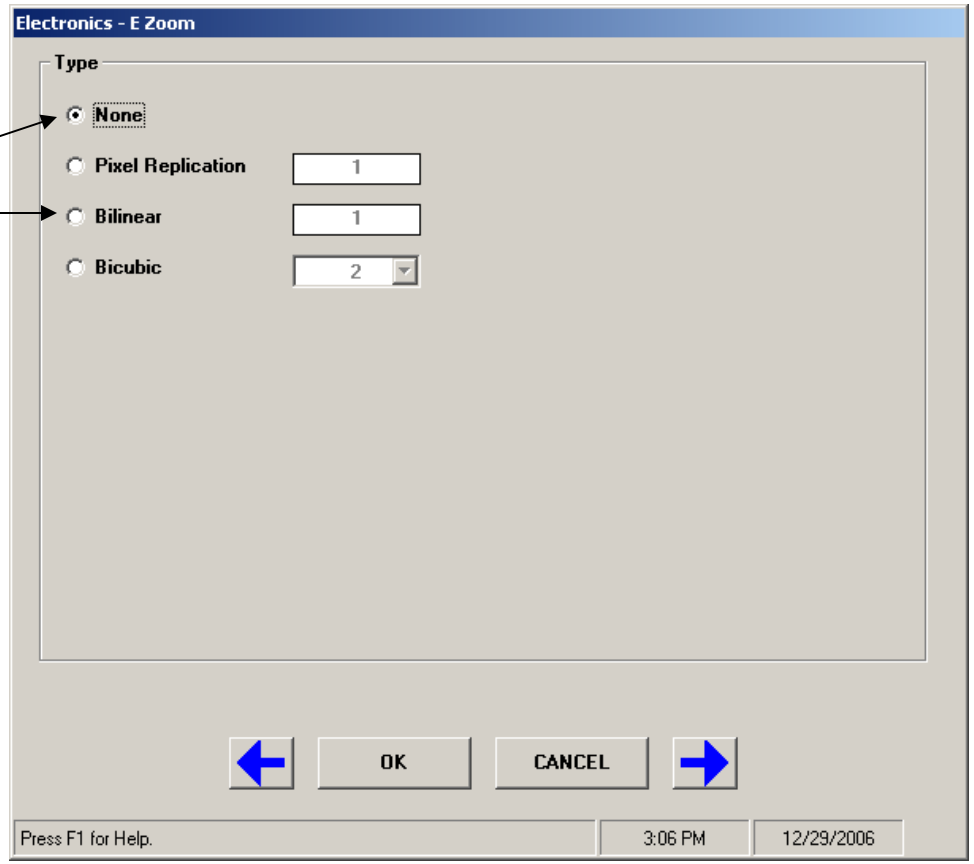
- CFI


Electronics - Digital Filters
Horizontal
Digital Filter?
None
Odd
Even
Number of Values
0
Left Side Kernel Values
Edit Values
Vertical
Digital Filter?
None
Odd
Even
Number of Values
0
Left Side Kernel Values
Edit Values
OK
CANCEL
Press F1 for Help.
7:59 PM
12/29/2006

NVTherm

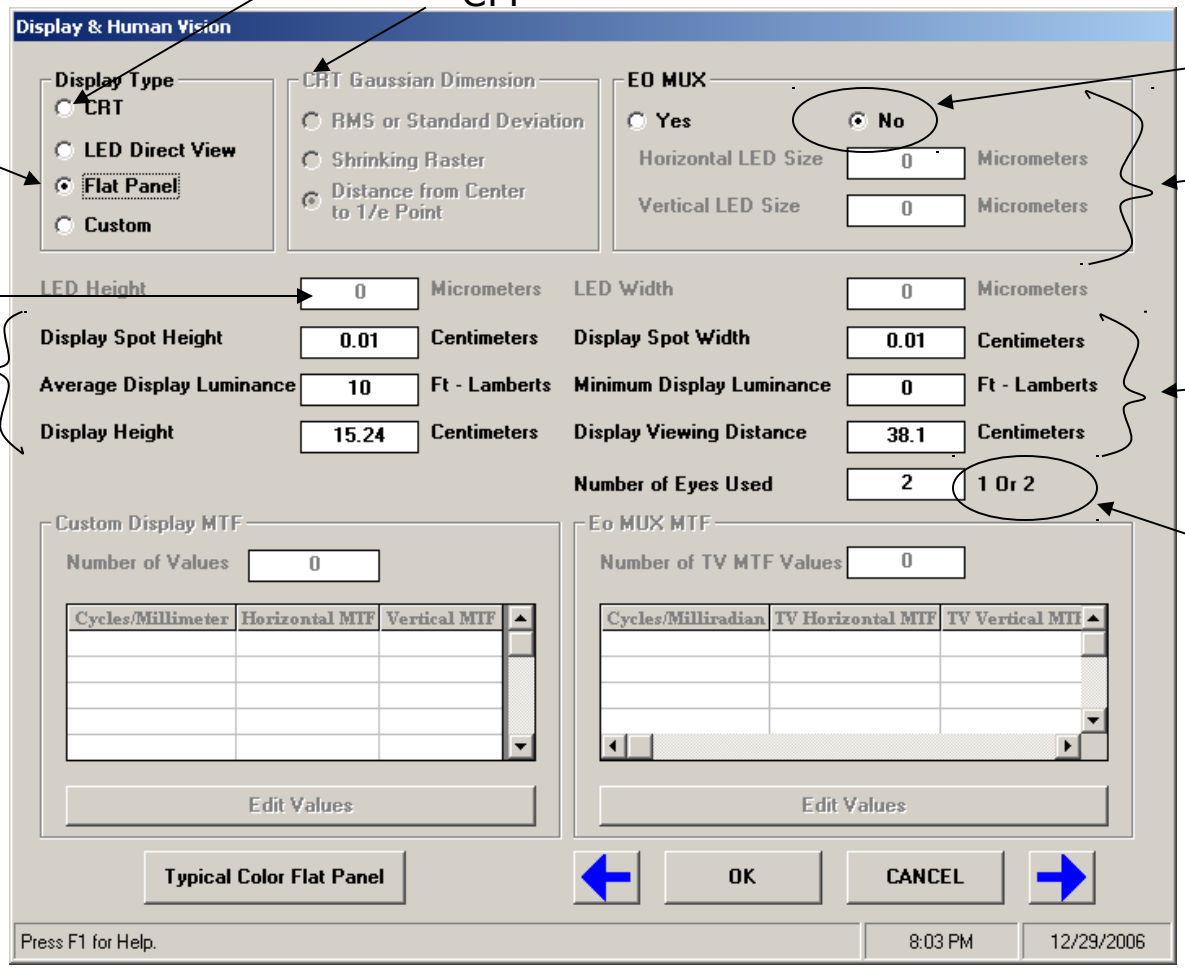
- CFI

E-zoom is used to increase the effective magnification of the system.



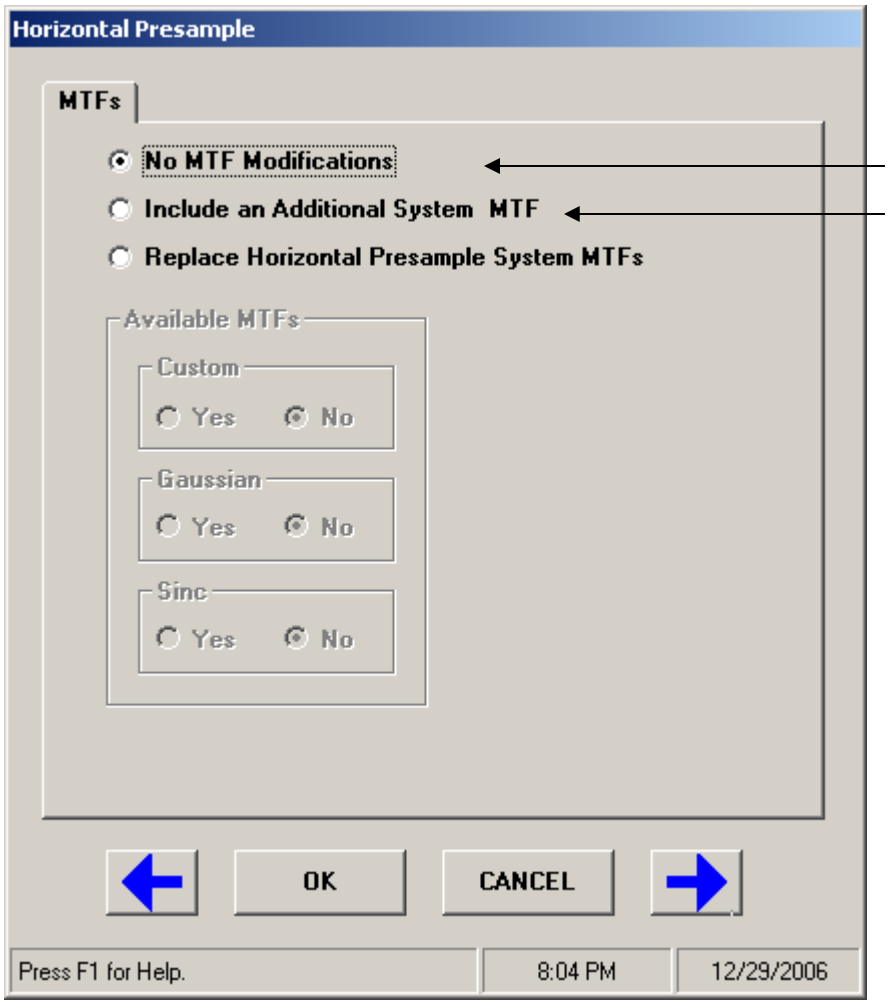
NVTherm

- For AMLCD or OLED use Flat Panel.
- CFI – Display Spot Height is the pixel size for the flat panel displays and measured per the CRT Dimension checked above for a CRT. Display Height should represent the area of the physical display used for active STS imagery



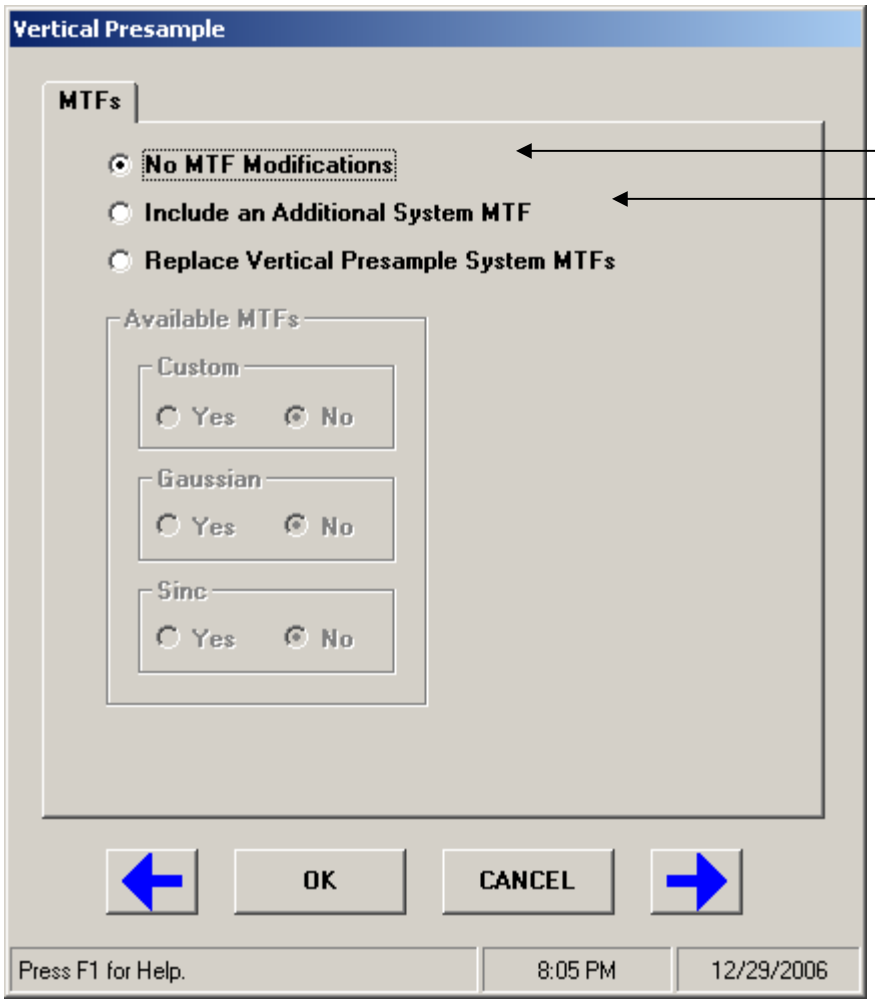
- GFI = "No"
- N/A
- CFI
- GFI = 1

NVTherm



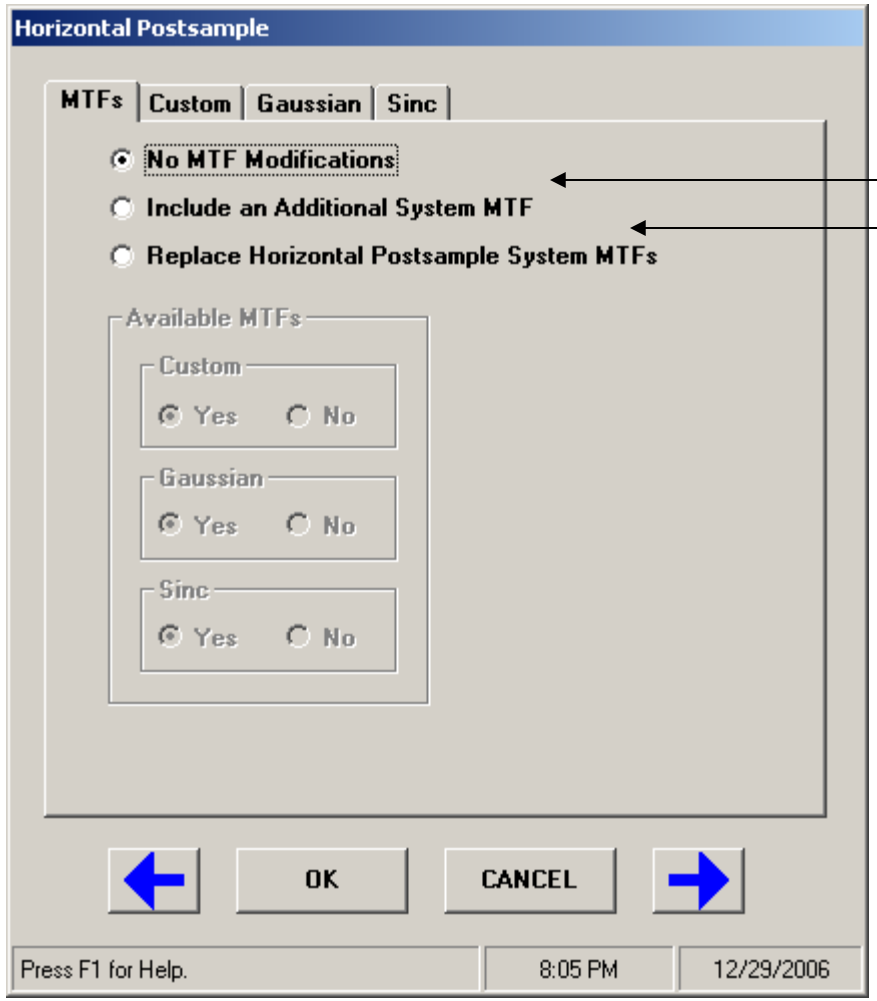
- CFI. Optional. However, if provided, submit narrative as to method of data collection.

NVTherm



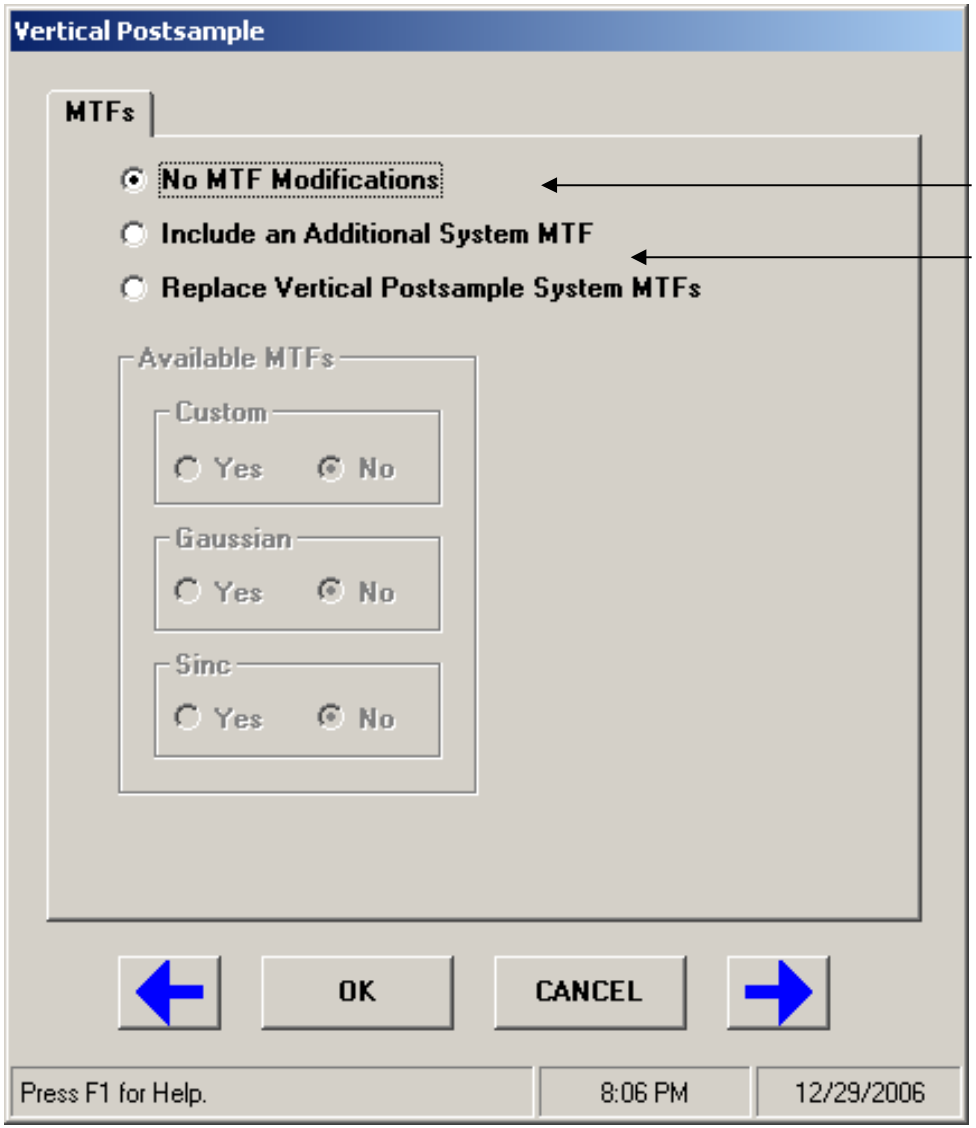
- CFI. Optional. However, if provided, submit narrative as to method of data collection.

NVTherm



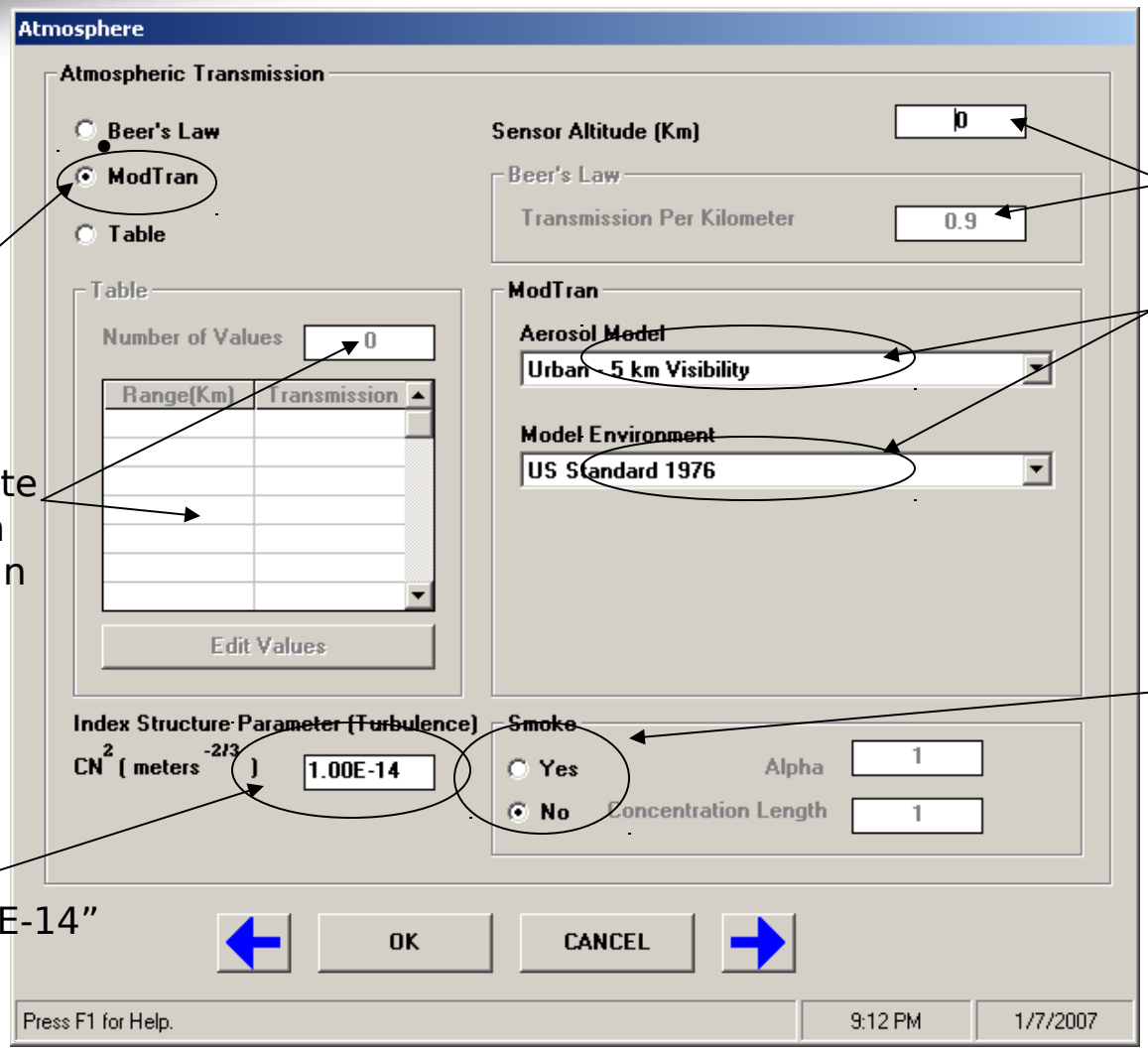
- CFI. Optional. However, if provided, submit narrative as to method of data collection. (See General Note 8)

NVTherm



- CFI. Optional. However, if provided, submit narrative as to method of data collection. (See General Note 8)

NVTherm

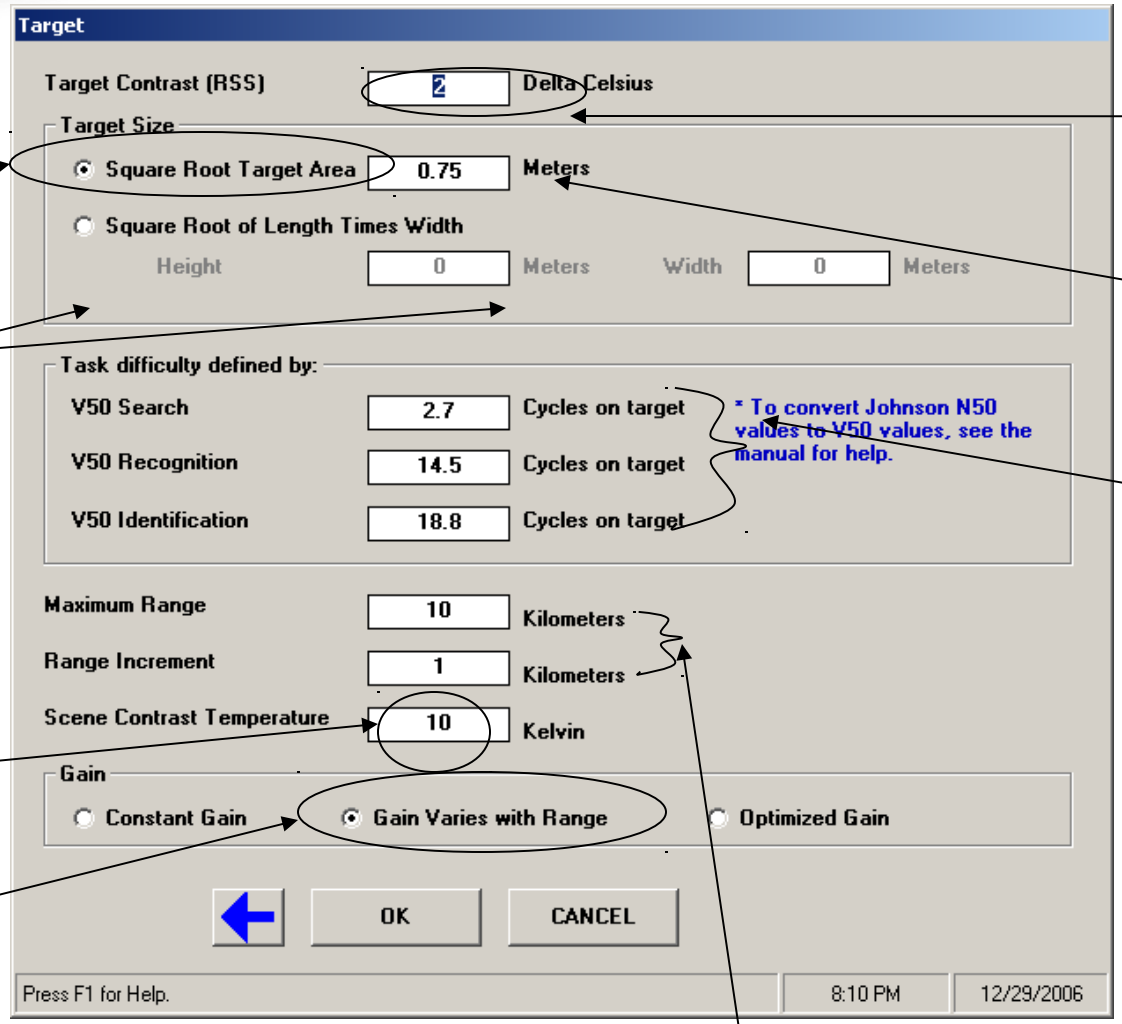


- GFI
- N/A
- GFI = "5 KM Urban"/ "US Standard 1976"

Auto-calculated when ModTran is run

- GFI = No
- GFI = "1.0E-14"

NVTherm



- GFI
- N/A
- GFI = .75
- GFI = TBD
- GFI = 3.5 degrees
- GFI – "Gain Varies with Range"
- GFI =

	Threshold	Objective
Max. Range	0.300	0.700
Range Increment	0.02	0.04

Squad Thermal System

Mr. Benjamin Kaler

Project Officer

Thermal Systems Integrated Product Team (IPT)

Squad Thermal System

Mr. Benjamin Kaler

- Objective: To provide a Commercial / Non-Developmental Item (NDI) that will be a weapon-mounted clip-on thermal night sight and can be used in conjunction with the AN/PVQ-31A/B Rifle Combat Optic. It will also be a lightweight, “pocket-sized” short-range thermal imaging system, with an integrated ANSI Z136.1-2000 Class 3B eye-safe infrared laser pointer (operable in an eye-safe mode) that is compatible with the Marine Corps’s existing image intensification (I2) night optics.

Squad Thermal System

Mr. Benjamin Kaler

- Currently two capabilities fielded to OPFORs in theater.
  - Clip-on Thermal
    - Works with AN/PVQ-31A/B
  - Pocket Thermal
    - Laser Pointer

- Fielded to all deployed Infantry units in the Marine Corps.
- PM ONS intends to procure a single replacement system that is the combination of both capabilities into a single platform.

Squad Thermal System

Mr. Benjamin Kaler

- The STS will allow the operator to detect and recognize potential targets, danger areas, and items of interest and designate them with an integrated IR Laser Pointer.
- The intent is to field to Fire Team Leaders, Squad Leaders, Reconnaissance Team Leaders, & Machine Gun Team Leaders.
- This will provide a thermal imaging system to augment the capability of organic I^2 systems such as the AN/PVS-14, AN/PVS-17C, AN/PVS-24A, and AN/PVS-27.

Squad Thermal System

Mr. Benjamin Kaler

- The STS will be used in conjunction with the AV/PVQ-31A/B RCO.
  - The STS shall present a 1X image.
  - When viewed through the RCO, the STS shall present an image consistent with the geometry and size of that presented by the day optic alone.
  - The controls of the STS shall be located on the system,` with a remote control unit that can be located at the shooter's fingertips. The shooter should be able to maintain full control of the weapon at all times with both hands.
  - The placement of the STS on the weapon shall be as close to the center of balance as possible.

Clip-on Thermal Capability

Mr. Benjamin Kaler

- IR Laser
  - Must align to center of STS FOV
  - Class 1 and 3b selectable w/safety interlock
  - Control at shooter's fingertip/thumb-tip (not trigger!)
  - Reduce weight for shooters
  - Survive drop and remain aligned
- Controls at Shooter's Fingertips
  - Wires should be minimal
- Mount in front of or adjacent to the RCO, without the need to relocate the RCO for any user.
  - Remember the rail split!

KPP Thermal Capability

Mr. Michael Berry

Attribute	Shall	Should
<u>Compatibility with Optics</u>: The system shall be a thermal imager that is compatible and interoperable with the AN/PVQ-31A/B Rifle Combat Optic (RCO)	**Without requiring the operator to move the RCO or re-BZO**	Compatible with other day optics without requiring the operator to move or re-BZO
<u>System Weight</u>: System shall weigh less than	**21 ounces in either weapon-mounted or handheld configuration**	12 oz in either configuration
<u>Probability of Recognition</u>: When operated in conjunction with the RCO, the STS shall provide the operator at least an 80 percent probability of recognizing moving, man-sized targets	**at all ranges between 10 and 300 meters**	at all ranges between 10 and 700 meters to reach the maximum effective range of the weapon

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
General Attributes		
1. Thermal Imager: The STS shall be	a monocular thermal imager	
2. Operational Configurations: The STS shall be usable	both as a clip-on weapon sight (weapon-mounted configuration) and as a standalone, handheld thermal optic (handheld configuration).	
3. Laser Pointer: The STS shall include	an integrated, near-infrared laser pointer.	
Weapon Mounted Operation		
4. Attachment: The STS shall be compatible with and attach to	the M16A4, M4, and M4A1 rifles along with a USMC day optic. If the STS attaches to the weapon via an M1913 rail, it shall be mounted using a throw-lever with a locking mechanism.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Weapon Mounted Operation		
5. Tool Use: Attaching the STS to the weapon	not require the use of tools once the initial weapon-matching adjustments have been performed.	
6. Weapon Operation: In the weapon-mounted configuration, the STS shall	not in any way interfere with the user's ability to operate the weapon system or disturb his firing position.	
7. Image Shift: Attaching the STS in front of an RCO shall	not cause a change in the point of aim greater than 1.0 minutes of angle.	
8. Weapon Accuracy: Attaching the STS to a weapon system shall	not cause a shift in the point of impact which exceeds 1.0 minutes of angle.	
9. Weapon Function: In the weapon-mounted configuration, the STS shall	not in any way interfere with the form, fit, or function of the host weapon.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Handheld Operation		
10. Operation: The STS shall be	usable as a standalone, handheld thermal optic.	
11. Ergonomics: When used in the handheld mode, the STS shall	be shaped so that it can be operated with one hand.	
12. Accessories: Any accessories needed to operate the STS in the handheld configuration shall	not interfere with the user's grip on the system or with mission essential gear such as helmets and goggles.	
Optical Characteristics		
13. Magnification		
13a. Magnification: In the weapon-mounted configuration, the STS shall	provide imagery at unity magnification.	
13b. Distortion: In the weapon-mounted configuration, the STS shall	not cause distortion in the field of view of the day optic.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Optical Characteristics		
13c. Bullet-Drop Compensator: In the weapon-mounted configuration, the STS	shall not impact the function of the bullet-drop compensator.	
13d. Zoom: The STS		may incorporate optical or electronic zoom capability for use in the handheld mode.
14. Field of View: The FOV in the weapon-mounted configuration shall	not constrict the field of view of the RCO. The horizontal field of view of the STS shall be at least 16° in the handheld mode.	The horizontal field of view of the STS should approach 25° in the handheld configuration.

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Optical Characteristics		
15. Depth of Field: The STS shall	be operable over at least 75 percent of its maximum recognition range without the need for any focus adjustment.	
16. Frame Rate: The STS shall provide imagery at a detector frame rate of	at least 29.9 Hz. The frame rate of the display shall be equal to or greater than that of the detector.	60 Hz.
17. Latency: The video provided to the user by the STS shall	not have latency greater than one detector frame.	
18. Motion Induced Blur: The imagery provided by the STS shall	be free of streaking or blurring caused by movement of the sensor or targets.	
19. Automatic Gain Control: If the STS has integrated Automatic Gain Control (AGC),	it shall be possible to disable the AGC and adjust the detector gain and level manually.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Optical Characteristics		
20. Image Quality:	No defects detectable by the operator shall be present within critical areas of the field of view of the STS.	
Infrared Laser Pointer		
21. Wavelength: The STS shall	possess an integrated laser pointer with an output wavelength between 820nm and 880nm throughout operating temp. range.	
22. Output Power: The STS laser pointer shall operate	in three modes: a safe mode in which the laser is disabled, an eye-safe training mode, and a high-power tactical mode.	
22a. Safe Mode: In Safe Mode, the laser	shall be disabled. The STS laser shall remain in safe mode from system startup until the operator manually places it into one of the active modes.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Infrared Laser Pointer		
22b. Training Mode Power: In Training Mode, the laser output power shall be	between 0.2mW and 0.6mW throughout the operating temperature range.	
22c. Tactical Mode Power: In Tactical Mode, the laser output power	shall not exceed 33mW at room temperature (20°C ± 5°C). Tactical Mode shall not be accessible without first clearing mechanical interlocks.	
23. Laser Reticle: The laser reticle shall	allow the operator to accurately point the STS's laser pointer. The laser reticle shall be viewable within the field of view in both weapon-mounted and handheld configuration without obscuring the target. The reticle shall be displayed whenever the laser pointer is in either Training or Tactical mode. The center of the laser spot shall be aligned with the center of the reticle to within 2.0 mrad.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Infrared Laser Pointer		
24. Laser Activation: The laser shall be activated (fired)	by a push-button switch. The switch shall be a momentary-on switch; the laser shall only fire while the button is pressed. The laser shall not operate in a continuous-on mode.	
25. Laser Active Notification:	An indicator shall be visible to the operator within the field of view of the STS at all times in which the laser is active (firing).	
26. Laser Safety: The STS laser	shall have a safety system that complies with OPNAVINST 5100.27B. The STS shall be approved for use by the Laser Safety Review Board. The STS shall have three safety interlocks that must be cleared to fire the Class 3B laser.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Interface		
27. Connectivity		
27a. Video Output: The STS shall	provide a real-time RS-170 video output.	
27b. Data Connectivity: The STS shall provide	either a USB or RS-485 data connection. The data port shall be usable for upload and download of data and detector calibration files.	
27c. Connector Type:	The STS shall not include the 19-pin Tyco connector (Nano-miniature Circular Connector QCM019SC2DMC16F).	The STS should have as few connectors as possible installed to meet the external interface requirements.
28. Tooling:	The STS shall not require the use of tools during operation.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Interface		
29. Non-Uniformity Calibration (NUC): The STS shall	not require the user to cover or block the objective lens for field calibration during the course of one operational cycle (battery lifetime). If the system has automatic calibration, it shall be possible to disable it.	
30. Operator Controls		
30a. Operations: The STS shall, at a minimum,	allow the operator to perform a field calibration (NUC), select polarity, and adjust the display brightness and the detector gain and level.	
30b. Operator Interface: The operations described in 30a shall	be operable by way of an electronic menu which does not require the user to cycle through options or by way of direct, independent controls on the STS body.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Interface		
30. Operator Controls		
31. Body Controls: The STS shall have	controls mounted to its body which allow the user to execute all functions of the system.	
32. Remote Controls		
32a. Functionality: The STS shall have remote controls… (These functions shall be activated directly without having to access a menu.)	which are operable in the weapon-mounted configuration without disturbing the user's firing position that allow NUC, polarity, and to adjust the gain and level.	allow the user to fire the laser if it has already been armed through the software menu.

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Interface		
32. Remote Controls		
32b. System Interface: The STS remote controls shall	not incorporate a radio or optical link to the STS body. The remote control interface shall be routed closely to the weapon without interfering with the weapon's operation or presenting a snag hazard to the operator.	
Human Systems Integration		
33. Ergonomics		
33a. Size and Shape: The STS, its remote controls, and all accessories shall	be operable with one hand by users whose hands are within the 5th to 95th percentile for size relative to other Marines.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Human Systems Integration		
33. Ergonomics		
33b. Handheld Configuration: In the handheld configuration, the STS shall be	shaped to maintain neutral wrist-posture, contoured to fit the hand comfortably, and designed for one-handed use by both right-handed and left-handed users.	
33c. Weapon-Mounted Configuration: In the weapon-mounted configuration, the STS remote controls shall	allow both right-handed and left-handed users to operate the STS without disturbing their firing position.	
34. Gloved Operation: All STS controls (body controls and remote controls) shall	be operable by a user wearing any standard issue Marine Corps gloves.	
35. Usability		
35a. Physical Controls: The STS controls, both those on the body and those on the remote, shall	be easily distinguished from each other by both sight and touch; tactile feedback to the user; and be organized in an intuitive	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Human Systems Integration		
35. Usability		
35b. Software Menus: The electronic menus used in the STS interface shall	be organized in an intuitive, straightforward manner to facilitate ease of use and to allow for selections among few alternatives.	Menus needed only for maintenance purposes may be hidden from the operator, but must be addressed by the maintenance manual.
35c. Indicators and Warnings: Any indicators and warnings presented to the user within the field of view of the STS shall be	clear and easily interpreted. They shall not interfere with critical areas of the field of view of the STS in either weapon-mounted or handheld configuration.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Human Systems Integration		
36. Integration with Mission-Essential Gear: The STS shall	integrate with mission essential gear worn by the user. This includes: helmets, goggles, visors, gloves, load-bearing equipment, and body armor.	
Power		
37. Battery Life: The STS shall	be operable using a single battery load for at least 2 hours per installed battery at a temperature of 0°C.	
38. Battery Type: The STS shall	operate using batteries which are commercially available and UL listed.	
39. Battery Safety: The STS and its batteries shall	comply with the requirements of the Lithium Battery Safety Program as described in NAVSEA S9310-AQ-SAF-010.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Power		
40. Start-up Time: The STS shall	provide a useable thermal image within 5 seconds of the user powering the system on.	
41. Low-Power Indicator: The STS shall	provide a low-power indicator to the user when approximately 30 minutes of battery life remain. Indicator shall be visible within the field of view in both the handheld and weapon-mounted configurations.	
42. Battery Replacement: Replacing the batteries shall	not require the use of tools or the removal of the STS from the weapon.	should be able to replace the batteries with one hand.
43. External Power: The STS shall	be operable using power supplied via an external interface for maintenance and testing.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
User Survivability		
44. Light Emissions: In both the weapon-mounted and handheld configurations, the STS shall possess an interface between its eyepiece and the day optic or user's face (as appropriate to the configuration) that prevents any light leakage visible from a range of 25 meters	to an unaided, dark-adapted observer.	to an observer equipped with an image-intensification (I2) device.
45. Noise Emissions: The STS shall not emit noise detectable by an unaided observer from a range of… (Noises louder than 45dB(A) are considered detectable.)	25 Meters	1 Meter
46. Body Finish: The STS body, remote control, carrying case, tactical pouch, and any accessories shall be	a tactical color and have a matte finish.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Environmental Resistance		
47. Waterproofing: The STS shall be waterproof, without the use of a waterproof bag or case and with the battery cover open, to a depth of	1 meter of saltwater for a period of 15 minutes.	20 meters of saltwater for a period of 2 hours.
48. Operating Temperature: The STS shall be operable with no performance degradation in temperatures ranging from	-18°C to +52°C.	-36°C to +60°C.
49. Storage Temperature: The STS shall withstand temperatures (with no physical damage or degradation in performance) ranging from	-40°C to +74°C while non-operational.	
50. Altitude. The STS shall exhibit no performance degradation when operating from	-400 meters to +4570 meters above sea level or after exposure to a pressure altitude of 12200 meters.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Environmental Resistance		
51. Sand and Dust: The STS shall	withstand the effects of airborne sand and dust with its lens covers closed.	
52. Drop Shock: The STS shall withstand, without the need for the soft carrying case or tactical pouch, being dropped from a height of	1 meter onto hard-packed earth with its lens covers closed with no physical damage or performance degradation. The STS shall survive such impacts in both the weapon-mounted and handheld configurations.	
53. Scratch Resistance:	The STS lenses shall be scratch resistant.	
54. Resistance to Chemicals and Fluids: The STS shall not be physically damaged or suffer performance degradation caused by	the effects of contact with common chemicals and fluids, including, but not limited to: CLP, DEET, sunscreen, motor oil, diesel fuel, transmission fluid, acetone, and ethylene glycol.	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Environmental Resistance		
55. Vibration:	The STS shall withstand the effects of vibration during transit by sea, land, or air per the guidelines of MIL-STD-810G.	
56. Lens Cover:	The STS shall possess a retainable protective cover for the objective lens.	
57. Weapon Firing Effects:	The STS shall withstand the heat and shock associated with repeated firing of any weapon with which it is compatible (ref. requirement 4) with no physical damage or performance degradation.	
Storage and Maintenance		
58. Carrying Case:	The STS shall include a soft carrying case.	
58a. Capacity:	The carrying case shall include space for the imager, tactical pouch, and all	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
Storage and Maintenance		
58b. PALS: The carrying case shall include a PALS weave	which allows it to be attached to individual load-bearing equipment and shall allow quick access to the STS.	
59. Tactical Pouch:	The STS shall include a tactical pouch.	
60. Storage: The STS shall	not require any special storage beyond that already available within the USMC for existing optical equipment.	
61. Maintenance		
61a. Organic Maintenance: The STS shall be	maintainable across the full spectrum of organic maintenance by designated Marine Corps personnel.	
61b. Lifecycle Logistics: The system shall include lifecycle logistics and maintenance including electronic support	which will allow the system to be aligned at the Operator/Crew and/or Field levels of maintenance in support of Marine Corps organic	

Squad Thermal System

Mr. Michael Berry

Attribute	Shall	Should
62. Reliability and Availability		
62a. Mean Time Between Failures:	The STS shall provide a Mean Time Between Failures (MTBF) of at least 2000 hours.	
62b. Mean Time to Repair:	The STS shall not require more than 10 minutes mean time to perform operator/crew level maintenance tasks. The STS shall not require more than 2 hours mean time to perform field level maintenance tasks.	

Break

Logistical Requirments

Mr. Paul Carroll

Logistics Management Specialist

PM ONS

Logistical Requirements

Mr. Paul Carroll

- Supportability and Maintainability
  - Supportability Demonstration to follow contract award (<6 months)
  - Organic Maintenance for all POR (O/C, Field, Sustainment Levels)
  - Interim Contractor Support (ICS) for 1st Year (or less)
  - Reduced Warranty periods
  - Spares to be delivered with initial systems
    - Warranty begins “in-service” or by internal clock
    - No funded rotable (float) pool w/turn-around times
  - Electro-optical Maintenance using existing tools and test equipment in Marine Corps inventory
    - MOS 2171 EO Repairer

Logistical Requirements

Mr. Paul Carroll

- System Support Package
  - Existing Maintenance Equipment
    - AN/USM-617A VIPER-T
    - AN/PSM-117 Application Program Set (APS) for Thermal Devices
  - Laser Alignment Station and Procedure
    - Must use existing equipment
    - Limit Special Tools required to diagnose and repair the sight
  - Any Special Tools must be COTS IAW FAR Definitions clause
  - Diagnostic BIT/BITE Windows-based, operable on CHWS Laptops

Logistical Requirements

Mr. Paul Carroll

- BIT/BITE preferred
- System Reliability per Performance Specification
  - Vendor Transparency on methods used to determine Reliability calculations for MTBF, MTTR
- MTTR
  - Intermediate repairs shall not exceed 2 hours
  - Operator repairs shall not exceed 10 minutes
- ICS Submission Requirements
  - Very strict adherence requirement
  - Cost and work break-outs required

Logistical Requirements

Mr. Paul Carroll

CLS Level of Repair- Brief Definitions

- Screening /Assessment
  - 1% BER
  - 4% Screening/Assessment (req's maint. or exhibits no failure)
- ICS Minor - Level 1
  - 8% of new system cost
- ICS Moderate - Level 2
  - 40% of new system cost
- ICS Major - Level 3
  - 65% of new system cost (or equal to or greater than 110% of the Level 3 repair price as defined by the contract)
    - Decision to repair made by Government PM

Lunch

One-on One Sessions

One-on-One sessions to be hosted at Lockheed Martin 125 Woodstream Blvd. Stafford, VA 22556